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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,544	08/16/2001	Lutz Rapp	112740-622	3251
29177	7590	10/23/2003	EXAMINER	
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			CUNNINGHAM, STEPHEN C	
			ART UNIT	PAPER NUMBER
			3663	

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,544

Applicant(s)

RAPP, LUTZ

Examiner

Stephen C. Cunningham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7-28-03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION

Priority

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Drawings

Objection to the drawings has been withdrawn

Specification

The objections to the Specification have been overcome by amendment and are therefore withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 2, 5, 6, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaede et al.

With respect to claim 1, Kaede et al. teach a method which inherently compensates for cross phase modulation, comprising the steps of:

generating a control signal from a part of the WDM signal, said control signal controlling the modulator; and

supplying said WDM signal to the phase modulator and modulating the optical WDM signal such that signal changes of the plurality of single signals caused by cross phase modulation are at least largely compensated.

See, for example, figures 4, 2d, 3d, 14 and column 7, lines 20-56, column 6, lines 34-40, and column 9, line 62 through column 10 line 11. Saunders et al. teach that a method where the signal is pre-modulated, then transmitted through an optical fiber where in group delay walkoff causes a low pass filtering effect on the XPM. The same group delay walkoff occurs due to phase modulation which in turn causes the low pass filtering of XPM in the Kaede et al. reference.

With respect to claim 2, Kaede et al. teach further steps comprising:

tapping an optical measurement signal;

converting said optical measurement signal into an electrical signal; and

converting said electrical signal into a control signal.

See figures 5 and 6, column 7, lines 23-25, and column 8, lines 1-20.

With respect to claim 5, Kaede et al. teaches a fiber amplifier inherently compensating for cross-phase modulation comprising:

a measurement coupler which couples out part of a WDM signal;

an opto-electrical converter;

an electrical amplifier; and

a phase modulator which receives a control signal and inherently compensates for XPM. See, for example, figures 2d, 3d, 4, 5, 6 and column 7, lines 20-56, column 6, lines 34-40, column 8, lines 1-20 and column 9, line 62 through column 10 line 11.

With respect to claim 6, Kaede et al. teach an electrical amplifier applying a sine function to the electrical signal. See column 7, lines 35-47.

With respect to claim 9, Kaede et al. teaches that the arrangement is connected immediately after the fiber amplifier, see figure 1, 4, 9, 10, 11; and that the arrangement is connected before the amplifier, see figure 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaede et al.

With respect to claims 3 and 7, Kaede et al. fails to teach a step of delaying the WDM signal. It is well known in the art that information travels slower in an electrical circuit than in an optical transmission line. It would have been obvious to delay the WDM signal in order to coordinate the modulation of the WDM signal with the control signal.

With respect to claim 4, Kaede et al. fails to teach a step of measuring signal changes at an output of said phase modulator. It would have been obvious to modify the method by detecting at the output in order to guarantee the calibration of the apparatus.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaede et al. in view of Becker et al.

Kaede et al. fails to teach that at least one of the measurement coupler and the phase modulator is inserted between a number of sections of an amplifier fiber. Becker et al. teach that multiple stages of amplifier fiber provides the benefit of significantly reducing noise while maintaining a high gain. It would have been obvious to modify the apparatus of Kaede et al. by distributing amplifier fiber around at least one of the measurement coupler and the phase modulator in order to reduce noise while maintaining a high gain. See pages 273-276.

Response to Arguments

Applicant's arguments filed 7-28-03 have been fully considered but they are not persuasive.

Applicant argues that the Kaede reference fails to disclose features for compensating for signal changes of a plurality of single signals forming an optical WDM signal caused by cross phase modulation. The Kaede reference does teach compensating for a plurality of signals as disclosed in figure 14.

Applicant argues that the Kaede reference fails to disclose generating a control signal from a part of the WDM signal for controlling the modulator. Applicant appears to be arguing that the detected part of the WDM signal contains a collection of the WDM signal wavelengths and collectively modulating the WDM signal. This is not supported by the claimed limitations which teach "coupling out a part of the entire optical wavelength-division multiplex signal". "A part" may be a single signal wavelength which is what is taught in the Kaede reference.

The applicant argues that the Kaede reference fails to teach the claimed features for compensating for cross phase modulation. This assertion is incorrect. The Kaede reference teaches a phase modulator that applies chirp to the signal. The chirp applied to the signal allows the signals to mutually walk-off, which causes low-pass filtering of the cross-phase modulation. The signal walk-off occurs after the signals are re-multiplexed in figure 14. The Sanders reference is used solely as evidence that the phase modulation and walk off taught in the Kaede reference inherently reduces XPM by means of dispersion walk-off.

Applicant is advised that a claim limitation such as "coupling out a part of the optical WDM signal, wherein the coupled out portion of the WDM single contains a portion of each wavelength in the WDM signal" may limit the scope such that the array of single signal modulators does not read on the claimed invention.

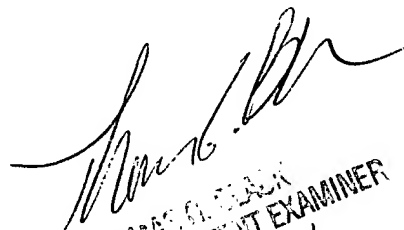
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on Monday - Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 703-305-8233. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

scc
October 20, 2003


THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600